

1. Which compound contains chlorine with the lowest oxidation number?



+1 -1



+1 -2 +1

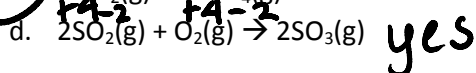
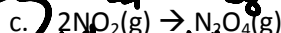


+7 -2

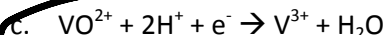


+1 -1

2. Which of the following is **not** a redox reaction?

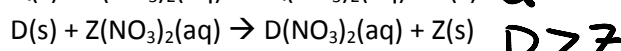
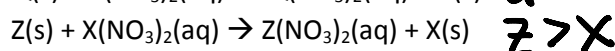
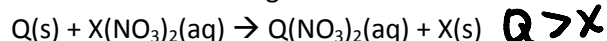


3. Which of the following half equations represents a reduction reaction?

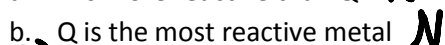


e^- on reactants (GER)

4. Consider the following reactions for four metals:



From these data it can be deduced that:



5. How many electrons are required when the following half equation is balanced using the smallest possible integers?



a. 2

b. 5

c. 10

d. 12

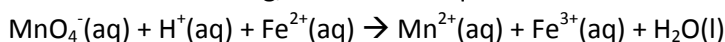


6.

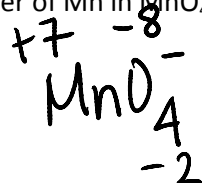
a. Define **oxidation** in terms of electrons.

loss of electrons

b. Consider the following, unbalanced equation for a redox reaction:



i. What is the oxidation number of Mn in MnO_4^- ?

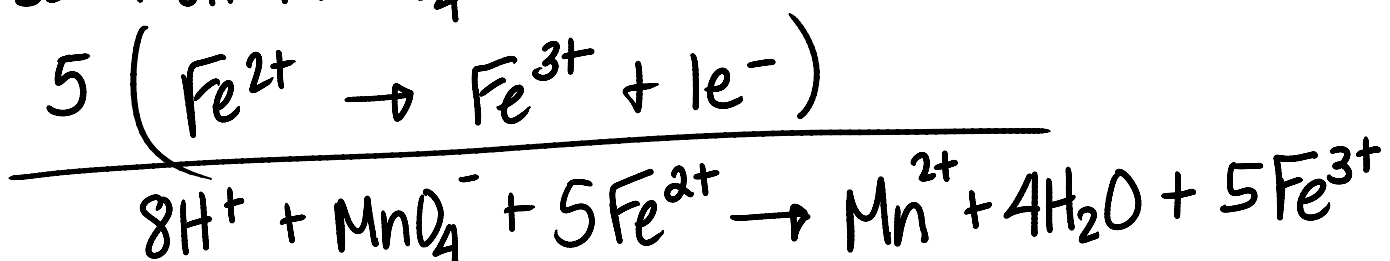
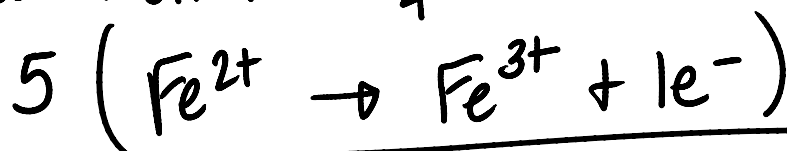
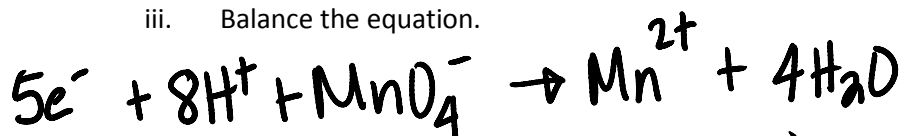


Mn = +7

- ii. Identify the reducing agent in this reaction.

Fe^{2+} because it's being oxidised

- iii. Balance the equation.



7.

- a. Define a **reducing agent** in terms of electrons.

the substance causing the reduction
that accepts the e^-

- b. A series of experiments was carried out in order to work out a reactivity series for some metals.
Different metals were added to solutions of salts and the following experimental data were obtained:

	Metal	Salt Solution	Observations
I	Zinc	Copper(II) sulfate	Brown deposit formed and the blue colour of the solution fades
II	Zinc	Lead(II) nitrate	Grey crystals formed on the piece of zinc
III	Copper	Lead(II) nitrate	No reaction
IV	Zinc	Magnesium nitrate	No reaction

- i. Write an ionic equation for the reaction that occurs in experiment I.



- ii. What do the results of experiment III indicate about the relative reactivity of copper and lead?

Since there is no reaction Cu is less reactive than Pb

- iii. Arrange the metals in order of reactivity, stating clearly which is the most reactive and which is the least.

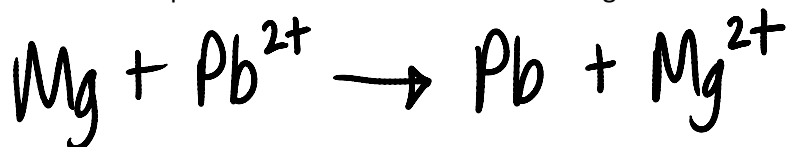
I. $Zn > Cu$ II. $Zn > Pb$ III. $Pb > Cu$ IV. $Mg > Zn$

$Mg > Zn > Pb > Cu$
ox

- iv. Explain which of the four metals is the strongest reducing agent.

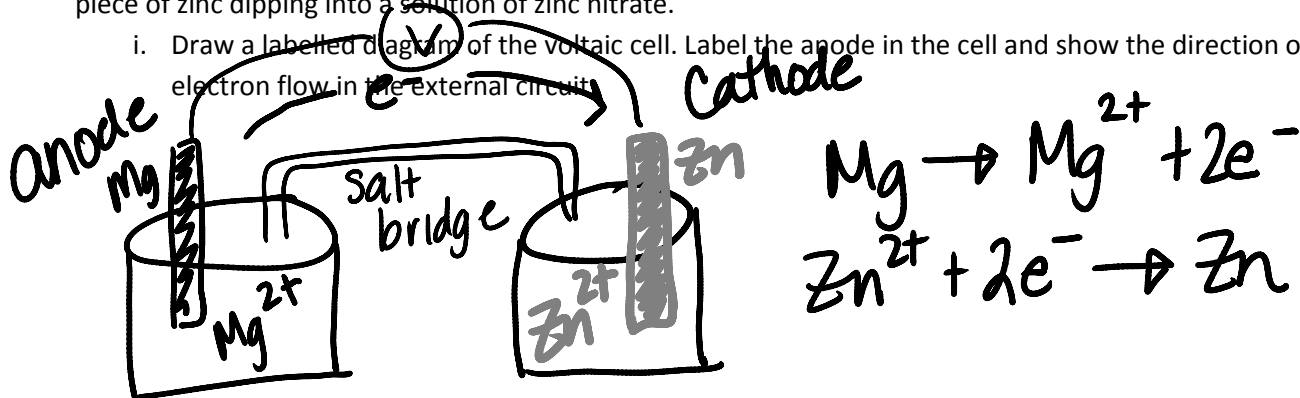
Mg is the strongest reducing agent because it give away its e^- easiest

- v. Write an ionic equation for the reaction between magnesium and lead nitrate.



- c. A voltaic cell was set up with a piece of magnesium dipping into a solution of magnesium nitrate and a piece of zinc dipping into a solution of zinc nitrate.

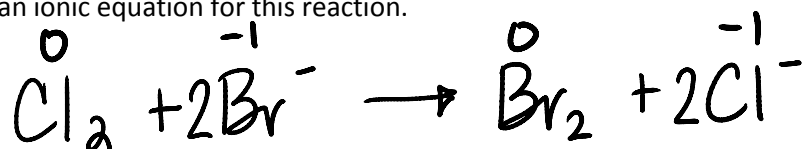
- i. Draw a labelled diagram of the voltaic cell. Label the anode in the cell and show the direction of electron flow in the external circuit.



- ii. Write an ionic equation for the reaction that occurs in the zinc half cell and classify this reaction as oxidation or reduction.



- d. When a chlorine solution is added to a solution containing bromide ions, a reaction occurs.
i. Write an ionic equation for this reaction.



- ii. Identify the oxidising agent in this reaction.



8. Sodium metal can be obtained by the electrolysis of molten sodium chloride.
a. Explain why solid sodium chloride does not conduct electricity but molten sodium chloride does.

Solid NaCl ions are fixed in lattice (ionic) structure
but
molten NaCl-ions are free to move around

- b. State the name of the product at the anode in this process and write half equations for the reactions at each electrode, stating clearly which is which.

